SONY

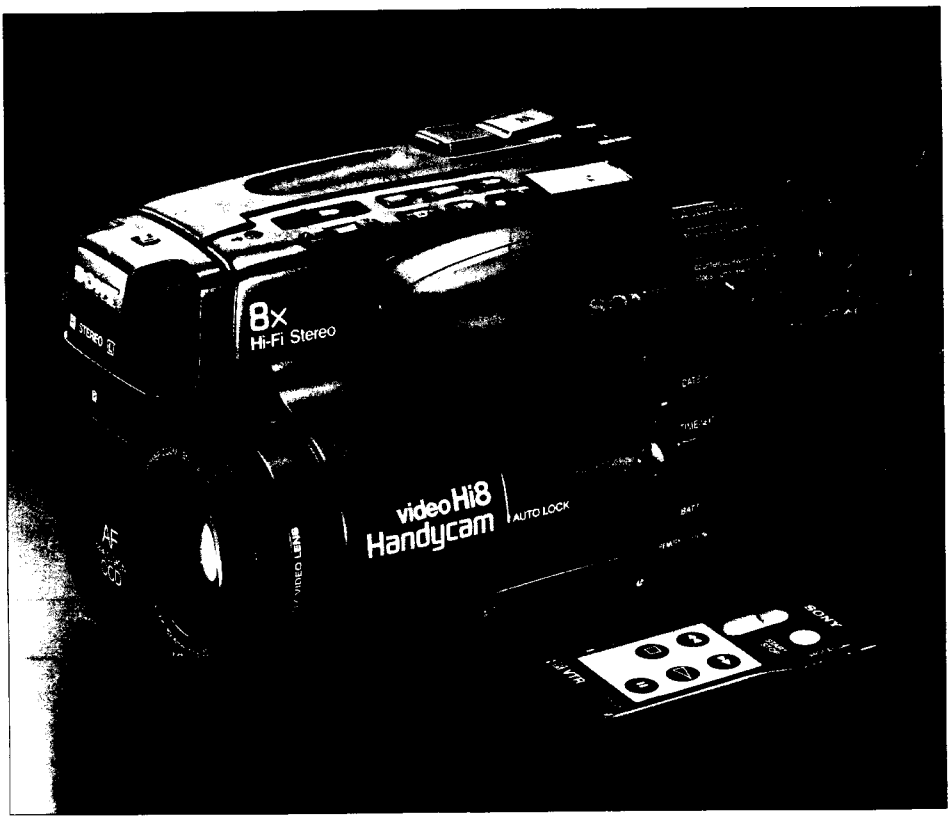
3-753-410-21 (1)

Video Camera Recorder Hi8

CCD-TR81

Operation Manual

Before operating this unit, please read this manual thoroughly and retain it for future reference.

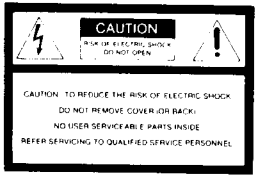


Video Hi8 Handycam

© 1991 by Sony Corporation

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK)
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Information for the customers in the U.S.A.
This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment away from the receiver
Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Notice for the customers in Canada
This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

Owner's Record

The model and serial numbers are located on the bottom. Record the serial number in the space provided on the right hand. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-TR81

Serial No. _____

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Welcome to Video Hi8

Thank you for purchasing a Sony Handycam® camcorder. With your Handycam you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

About This Manual

This manual shows you how to operate the camcorder.
To get the most out of the features of the camcorder, we recommend you read this manual thoroughly. But if you want to shoot immediately, please read the chapters, **Getting Started** and **Basic Operation**. Once you are familiar with basic operations, you may want to proceed to the chapter, **Advanced Operation**.

- As you read through this manual, please remember that buttons and settings on the camcorder are in capital letters.
  e. g. Slide POWER to CAMERA.
- Use "Identifying the Parts" at the end of this manual as a guide to find functions and operations printed on the camcorder itself.

Note on TV Color Systems

TV color systems are different depending on the countries.
If you view the playback picture on a TV, you need an NTSC system based TV (as this is an NTSC system based camcorder). Please check the list on page 67 to see the TV color system of your country.

Checking Supplied Accessories

Please check that the following accessories are supplied with your camcorder.

• Wireless Remote Commander (1)	• Remote Commander holder (1)	• Battery pack NP-55 (1)
• AC power adaptor AC-V30 (1)	• Lithium Battery CR2025 (2) (for camcorder/for the Remote Commander)	• RFU adaptor RFU-90UC (1)
• Shoulder strap (1)	• Lens cap (1) (attached to the camcorder)	• Jack cover (1) (attached to the camcorder)
• Step-up ring (1) ø 37 mm → ø 46 mm	• A/V connecting cable (1)	• S video connecting cable (1)
• Video cassette tape (1)	• Handy manual	

Before You Start

Before you can start recording, you need to:

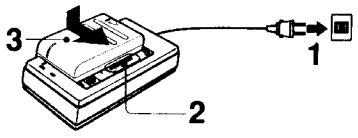
1 Charge and install the battery pack.
2 Insert the lithium battery.
3 Set the date and time.
4 Insert a tape.
5 Adjust the viewfinder lens to your eyes.
Let's go through these procedures step by step!

Charging and Installing the Battery Pack

The first thing you need to do is to charge the battery.
To do this, we show you how to charge and install the battery pack.

Charging the Battery Pack

First, you have to charge the battery pack.



1 Plug the AC power adaptor into a wall outlet.
2 Align the flat side of the battery pack with the line on the AC power adaptor.
3 Push down and slide the battery pack in the direction of the arrow.

Required charging time:

Type of battery pack	NP-55 (supplied)	NP-77HD	NP-77H	NP-77	NP-66H	NP-55H
Required charging time	60	140	140	120	110	70

(approx. minutes using AC-V30)

When charging is finished, the charge indicator goes out.

Important!

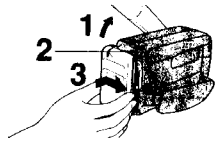
Use the battery completely before recharging!

Before you recharge the battery, make sure the battery has been used (discharged) completely to avoid reducing capacity of the battery caused by excessive charging.

To use up the battery, remove the cassette and simply slide POWER to CAMERA with the battery attached, and leave the power on until the ⌧ mark begins flashing rapidly and a red lamp flashes inside the viewfinder.

Installing the Battery Pack

When you have finished charging the battery, install the battery pack as follows:



1 Lift up the viewfinder.
2 Align the right side of the battery pack with the white line on the camcorder.
3 Slide the battery pack to the right.

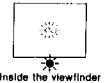
Note
Make sure the battery is securely installed so that it does not fall. If the battery is not installed properly, the camcorder will not record accurately.

A fully charged battery pack lasts for:

Type of battery pack	NP-55 (supplied)	NP-77HD	NP-77H	NP-77	NP-66H	NP-55H
Battery life	60	150	150	120	110	75

(approx. minutes, continuous recording when used indoors)

When the battery power becomes weak, the ⌧ indication and red lamp flash inside the viewfinder and the ⌧ indication flashes in the display window. Wait until they flash rapidly, then replace the battery pack with a fully charged one.

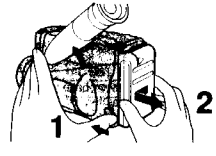


Inside the viewfinder

In the display window

To remove the battery pack

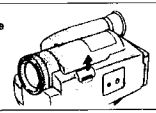
Press BATT in the direction of arrow (1), and at the same time, slide out the battery pack to the left (2).



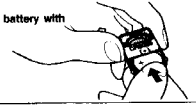
Inserting the Lithium Battery

To keep a title in the camcorder's memory as well as to activate the clock and the world clock, you need to insert a lithium battery. Make sure you use the supplied lithium batteries.

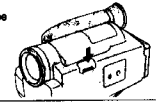
1 **Pull out the lithium battery holder from the bottom of the camcorder.**



2 **Insert the supplied CR2025 lithium battery with the + (plus) side facing up.**

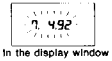


3 **Put the lithium battery holder back into the camcorder.**



Lithium battery life The battery lasts for approximately 1 year in normal operation. When the lithium battery becomes weak, the time indication keeps flashing in the display window and the indication flashes inside the viewfinder for about 5 seconds when POWER is set to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of any other battery may present a risk of fire or explosion.**

Inside the viewfinder



In the display window

While replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to readjust the date, time and title.

To change the lithium battery Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

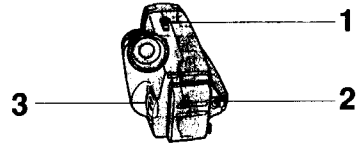
WARNING Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Cautions

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.
- Wipe the battery with a dry cloth to assure good contact.
- Be sure to install the battery with the correct polarity.

Setting the Date and Time

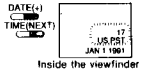
Now, let's adjust the clock inside the camcorder to be able to superimpose the date and time onto your video.
Make sure that the battery is attached and the lithium battery is inserted.
Make sure you are looking at the display window. To check the area name, look into the viewfinder. About the world clock, see page 32.



1 **While pressing the small green button on POWER, slide POWER to CAMERA.**

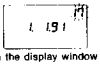
2 **Turn STANDBY up.**

3 **Press DATE (+) and TIME (NEXT) simultaneously for more than 2 seconds until area name and number appear inside the viewfinder and area number appears in the display window.**



Inside the viewfinder

DATE button now functions as + (to advance numbers) and TIME button functions as NEXT (to set).



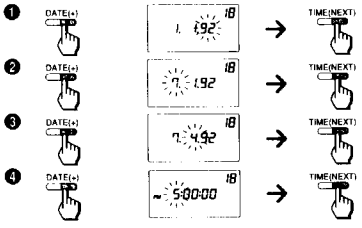
In the display window

4 **Press DATE (+) to select your area name and number, and press TIME (NEXT).**

The United States of America has 6 different time zones and Canada has 2 different time zones. The time zones and area names and numbers are as follows:

Time Zones	Area Name	Area Number
Hawaii Standard Time	HAWAII	15
Alaska Standard Time	ANCHRGE	16
Pacific Standard Time/West Canada	US. PST	17
Mountain Standard Time	US. MST	18
Central Standard Time	US. CST	19
Eastsern Standard Time/East Canada	US. EST	20

5 **Adjust the flashing digits of the year, month, day and hour using DATE(+), and press TIME(NEXT).**



Notes:
- When you keep DATE(+) depressed, the digits advance faster.
- 12:00:00 AM stands for midnight.
  12:00:00 PM stands for noon.

6 **Adjust the flashing digits of minute using DATE(+).**

7 **Press TIME(NEXT) to set the second to "00". The clock starts operating.**

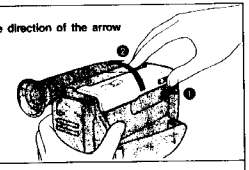
To correct the date and time settings Repeat steps 3 to 7.

To check the preset date and time. Press DATE(+) or TIME(NEXT). When you press the same button again, the indication goes off.

Inserting a Cassette

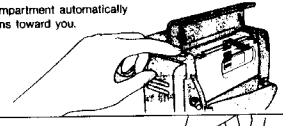
This section shows you how to insert a cassette. Make sure that the power source is attached.

1 **While sliding the lid lock in the direction of the arrow ●, lift up the lid ●.**

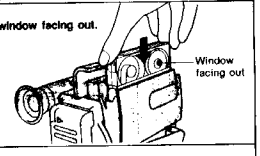


2 **Press EJECT.**

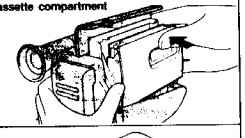
The cassette compartment automatically lifts up and opens toward you.



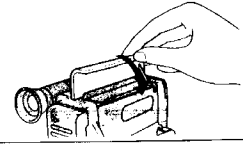
3 **Insert the cassette with the window facing out.**



4 **Press the PUSH mark on the cassette compartment cover to close it.**



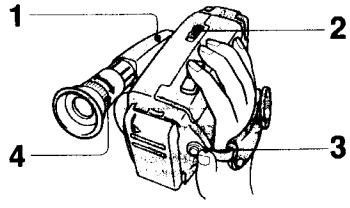
5 **Close the lid.**



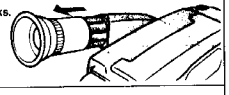
Adjusting the Viewfinder Lens

This section shows you how to adjust the viewfinder lens to best fit your eyesight. You may want to adjust the viewfinder lens when you use the camcorder for the first time, or when you use it after someone else has.

Make sure that the power source is attached.

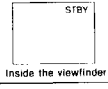


1 **Pull out the viewfinder until it clicks.**



2 **While pressing the small green button on POWER, slide POWER to CAMERA.**

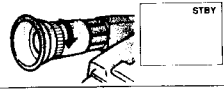
3 **Turn STANDBY up.**



Inside the viewfinder

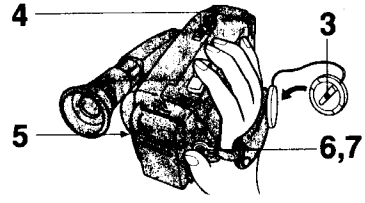
4 **Turn the viewfinder lens adjustment ring so that the "STBY" display inside the viewfinder screen comes into sharp focus.**

Now, you are ready to start recording.



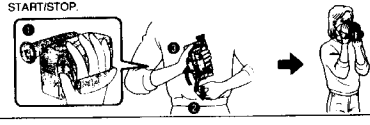
Camera Recording

This section shows the basic procedures for recording.
Make sure that the viewfinder is pulled out. Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working perfectly.
It is very easy to start recording!



1 **Hold the camcorder as illustrated.**

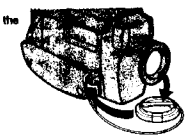
Put your hand through the grip strap, hold your camcorder against your body and pull the strap upward. Check that your thumb can easily touch START/STOP.



2 **Slide HI8 AUTO/OFF to AUTO.**

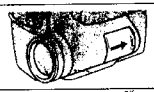
For details, see page 61.

3 **Remove the lens cap and attach it to the grip strap.**



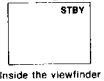
4 **While pressing the small green button on POWER, slide POWER to CAMERA.**

5 **Close the AUTO LOCK cover.**
This puts everything into automatic.



6 **Turn STANDBY up.**

"STBY" appears inside the viewfinder. Now you can see through the viewfinder. Focus is adjusted automatically.



Inside the viewfinder

7 **Press START/STOP once.**

The camcorder is now recording. The camcorder is recording when "REC" appears and the red lamp lights up inside the viewfinder.

Red lamp

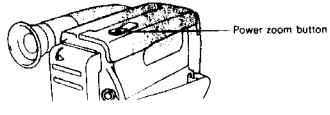
Inside the viewfinder, you can see a black and white picture of what you are recording, and information that indicates what the camcorder is doing.

To stop recording momentarily Press START/STOP again.
"STBY" appears inside the viewfinder.

To finish recording Turn STANDBY down and slide POWER to OFF.

Automatic recording When AUTO LOCK cover is closed, all the camera functions are on automatic (i.e. autofocus, auto exposure, auto white balance) and the shutter speed is set at normal (1/60 second).

When you shoot a subject within 1 m (3.3ft) of the lens If you cannot get sharp focus while in extreme telephoto zoom, press the W side of the power zoom button until you get sharp focus.



Near the end of the tape The ⌧ indication, the red lamp inside the viewfinder, and the camera recording/battery lamp on the camcorder flash slowly. When the tape reaches the end, the flashing becomes rapid.

To eject the tape Make sure that the power source is attached.
1 While sliding the lid lock in the direction of the arrow, lift the lid up.
2 Press EJECT.
The cassette compartment automatically lifts up and opens toward you.
3 Take out the cassette and press the PUSH mark on the cassette compartment cover to close it.
4 Close the lid.

Note on handling Do not pick up the camcorder as shown in the illustration.

If you wear glasses You can bend back the eyecup to get a better view of the viewfinder.

Notes on recording
- When you record from the beginning of the tape, run the tape for about 15 seconds before actual recording. This will ensure that you will not miss any start-up scenes when the tape is played back.
- If you move POWER during recording, the tape stops.
- When moving from indoors to outdoors, or vice versa, turn STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

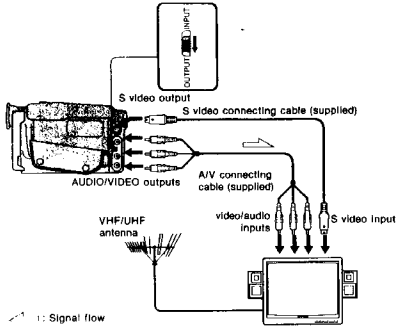
If you leave the camcorder in the standby mode for 5 minutes or more The camcorder goes off automatically. To re-enter standby mode, turn STANDBY down once and turn it up again. To start recording, press START/STOP.

If the light source changes suddenly When you shoot a subject under bright conditions just after you shoot in a dark place, the picture may not appear inside the viewfinder. In this case, point the camcorder in another direction.

Playing Back a Tape

This section shows you how to use this camcorder as a VCR by connecting it directly to your TV for playback.
There are several ways to connect the camcorder to your TV. Please check whether your TV has video/audio inputs.
If your TV does not have video/audio inputs, see page 51.

Connecting a TV with Video/Audio Inputs



1 Connect the camcorder and the TV using the supplied A/V connecting cable.

- If your TV has an S video input jack, connect the S video jack on the camcorder and the S video input jack on the TV using the S video connecting cable (supplied). In this case, you do not need to connect the yellow (video) plug of the A/V connecting cable.
- If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV. Do not use the red plug. In this case, the sound will be in monaural.

2 Set the INPUT/OUTPUT selector on the camcoder to OUTPUT.
3 Set the TV/VCR selector on the TV to VCR.

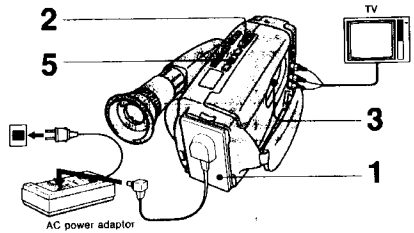
About the AUDIO/VIDEO jacks

The AUDIO/VIDEO jacks on this camcorder work as both input and output jacks. Set the INPUT/OUTPUT selector as follows.

in the OUTPUT position	to view the playback tape/to edit on another VCR
in the INPUT position	to record from another VCR or a TV

Playing Back a Tape

Now, you are ready to playback your tape.



1 Attach the connecting plate of the AC power adaptor to the camcorder and connect the AC power adaptor to a wall outlet.
Make sure that the INPUT/OUTPUT selector on the camcorder is set to OUTPUT.

2 While pressing the small green button on POWER, slide POWER to VTR.

3 Insert a tape.

4 Set the TV/VCR selector on the TV to VCR.
If you are connecting with RFU adaptor, turn on the TV and select the channel that you selected for the RFU adaptor (3 CH or 4 CH).

5 Press ▷ (PLAY).

Playback starts.
To stop playback, press □.
To rewind the tape, press ◀◀.
To advance the tape rapidly, press ▶▶.

When you have finished playback

1 Slide POWER to OFF.
2 Disconnect the AC power adaptor from the wall outlet.

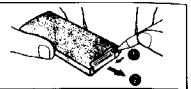
Using the Remote Commander

This section shows you how to use the supplied Remote Commander.

Inserting the Lithium Battery

First, you have to insert the lithium battery into the Remote Commander.

1 **Pull out the lithium battery holder from the Remote Commander.**



2 **Insert the supplied CR2025 lithium battery with the + (plus) side facing up.**

3 **Put the lithium battery holder back into the Remote Commander.**

Lithium battery life

The battery lasts for approximately 6 months under normal operation.

To replace the lithium battery

Open the lid of the lithium battery mounting surface, pull out the lithium battery, and insert a new one. **Replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another type of battery may present a risk of fire or explosion.**

WARNING

Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Cautions

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.
- Wipe the battery with a dry cloth to assure good contact.
- Be sure to insert the battery with the correct polarity.

Attaching the Remote Commander to the Remote Commander holder

You can clip the Remote Commander holder on your coat pocket or belt, or slide it onto the shoulder belt before attaching the Remote Commander to it.

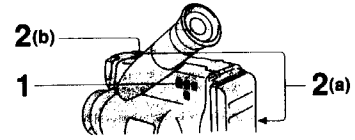
To remove the remote commander from the holder

To attach the holder to the shoulder belt

Remove this part before sliding the holder onto the belt.

Using the Remote Commander

With the Remote Commander, you can record yourself with your friends or family, or conveniently control the playback of your tape from a distance.



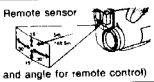
1 **Set REMOTE COMMANDER ON/OFF on the camcorder to ON.**

2 **Set POWER on the camcorder as follows:**

(a) When recording, 1) While pressing the small green button on POWER, slide POWER to CAMERA, 2) turn STANDBY up.

(b) When playing back, While pressing the small green button on POWER, slide POWER to VTR.

3 **Point the Remote Commander to the remote sensor on the camcorder and press the appropriate button on the Remote Commander.**



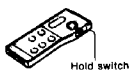
(Maximum distance and angle for remote control)

Note

The buttons that have the same name on the Remote Commander and on the camcorder functions equally.

To prevent misoperation

When you slide HOLD in the direction of the arrow, none the buttons on the Remote Commander will work to prevent any misoperation if you accidentally press a button.



Battery leakage

To avoid damage from possible battery leakage, remove the batteries when you do not plan to use the Remote Commander for a long time.

Notes

- Be sure that the Remote sensor is not in sunlight or strong light. In that case, you may not be able to operate with the Remote Commander.
- This camcorder works by the signals of VTR2 commander mode. If you use another Sony VCR at commander mode VTR2, we recommend you to change the commander mode or cover the remote sensor of the VCR with black paper to avoid misoperation.
- Be sure that there are no obstructions between the Remote Commander and the camcorder.
- Be sure to insert the lithium battery with the correct polarity. Otherwise, you cannot operate with the Remote Commander.

Getting the Most out of Your Battery Pack

This section shows you how you can get the most out of your battery pack.

Preparing the battery pack

We show you several hints that would be helpful when you prepare the battery pack.

Always carry additional batteries

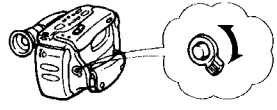
Have sufficient battery pack power to do 2 or 3 times as much recording as you have planned.
"Battery life" indicated in this manual is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.

Battery life is shorter in a cold environment

Battery efficiency is decreased and the battery will be used up more quickly if you are recording in a cold environment.

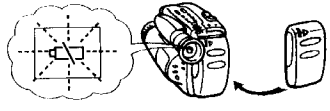
To save battery power

Turn STANDBY on the camcorder down when not recording to save battery power. A smooth transition between scenes can be made even if recording is stopped and started again.
While positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery will be also used when a tape is inserted or removed.



When to Replace the Battery Pack

When the ⊏□ indication inside the viewfinder changes from slow flashing to rapid flashing while you are recording, slide POWER to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth transition scenes after the battery pack is replaced.



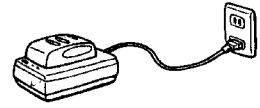
Notes on Charging

Now, we show you some hints for charging.

A brand-new battery

A brand-new battery pack is not charged. Before using the battery pack, charge it sufficiently.

A used battery pack

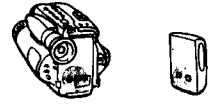


- Make sure to use up the battery before recharging.
- If recording is completed before the battery indication appears inside the viewfinder, we recommend you remove the tape, slide POWER to CAMERA, turn up STANDBY, and leave the camcorder until the battery indication flashes rapidly.
- Charging the still usable battery causes a lowering of battery capacity. Battery capacity can be recovered if you fully discharge and charge the battery again.

After long storage

Recharge the battery pack after a long period of storage.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.
Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Note on the Terminals



If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This improves the contact condition. Also, wipe the + and − terminals with a soft cloth or paper.

Notes on the Rechargeable Battery Pack

Battery heat up is normal

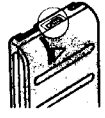
During charging or recording, the battery pack heats up. This means energy has been generated and a chemical change has occurred inside the battery pack. This is not dangerous.

Battery Care

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if POWER is set to OFF. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, we recommend you charge the battery right before using the camcorder.

The switch on the battery pack

This switch is provided so that you can mark the charged battery. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up (or in whichever direction you want to remind yourself).



The life of the battery pack

The battery pack can be fully charged and discharged about 500 times under normal temperatures. If the battery CD indication flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Charging temperature

Lower temperatures require a longer charging time. We recommend you charge under temperatures ranging from 10 °C to 30 °C (from 5 °F to 85 °F).

Alternative Power Sources

This section shows your available choice of the following power sources for your camcorder: battery pack (see page 7), house current (on this page), and 12/24 V car battery (see page 24). Choose the appropriate power source depending on where you want to use your camcorder.

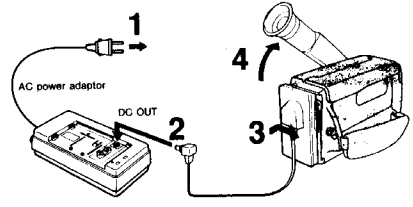
Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-77HD, NP-77H, NP-77, NP-66H, NP-55H
Indoors	House current	AC power adaptor AC-V30 (supplied), AC-S10, AC-V55
In the car	12 V or 24 V car battery	DC pack DCP-77

Note on power sources

Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. If this should happen, supply power again immediately.

Using House Current

Use the supplied AC-V30 AC power adaptor.



1 Connect the AC power adaptor to a wall outlet.
2 Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.
3 Align the right side of the connecting plate with the white line on the camcorder, and slide it to the right.
4 Lift up the viewfinder.

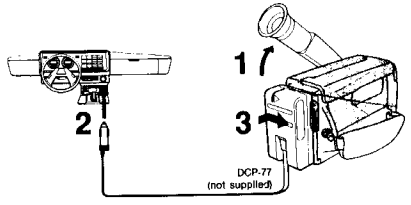
See the instruction manual of the AC power adaptor if you need additional information about the AC power adaptor.

To remove the connecting plate

Proceed in the same way as the battery pack. See page 7.

Using a Car Battery

The DCP-77 DC pack (not supplied) is required.



1 Lift up the viewfinder.
2 Connect the cord of the DC pack to the cigarette lighter socket of the car (12 V or 24 V).
3 Align the right side of the DC pack with the white line on the camcorder, and slide it to the right.

To remove the DC pack Proceed in the same way as the battery pack. See page 7.

Options for Charging

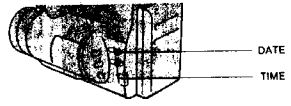
- AC-V55 AC power adaptor:
  You can charge two battery packs using this adaptor through house current. When you connect this adaptor with the DCC-16AW car battery cord, you can use your camcorder powered by a car battery.
- AC-S10 AC power adaptor:
  You can charge a battery pack whether it is used up or not with this adaptor because it has discharging function.
- BC-55 or BC-77 portable battery charger:
  You can charge a battery pack on 100-240 V AC current. (Ideal for travel.)
- DC-V30 car battery charger:
  You can charge a battery pack through the cigarette lighter socket of a car.

Camera Recording

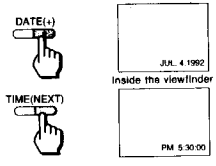
In the previous chapter, "Basic Operation", you have learned the basic recording operations. This section shows you how to record the date or time, record in a strong wind, re-record a picture, prevent accidental erasure, and more.

Recording the Date or Time

You can superimpose the date or time on your recording.



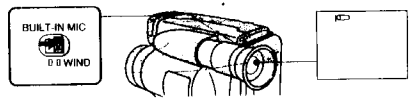
While you are recording or when the camcorder is in the recording standby, press DATE for date indication or TIME for time indication. The date or time displayed inside the viewfinder is recorded with the picture.



To stop recording with the date and time Press DATE or TIME again. The picture recording continues without the date and time.

Recording in a Strong Wind

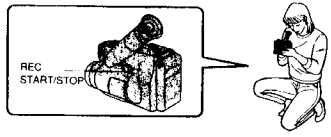
You can reduce the bass wind noise.



Set BUILT-IN MIC to WIND. The camcorder reduces the wind noise. The wind indication appears inside the viewfinder. After recording, be sure to return the switch to the green position. Otherwise sound may be recorded unnaturally.

For Low-position Recording

You can also record from a low position using another REC START/STOP button to get an interesting recording angle. When viewfinder is pushed down, you can monitor the picture without being close to the viewfinder.

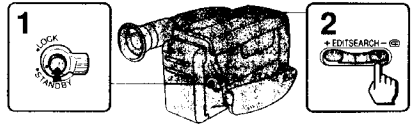


1 Adjust the viewfinder barrel. (You can turn it up to 90 degrees.)
2 Turn STANDBY up.
3 Press REC START/STOP with your left thumb.

To stop recording Press REC START/STOP again.

Rec Review Using EDITSEARCH

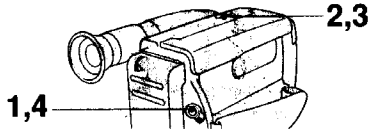
Using EDITSEARCH, you can check the last portion of a scene you just recorded in CAMERA mode. This is convenient for quick, on-the-spot checks.



1 Set the camcorder in the recording standby mode by pressing START/STOP.
2 Press the – (minus) side of EDITSEARCH (⏪) momentarily.
The last few seconds of the recorded portion is played back inside the viewfinder. After a few seconds of playback, the camcorder goes back to recording standby mode, ready for next recording.

Re-recording on a Previously Recorded Portion (EDITSEARCH)

You can reshoot a scene over the last recorded portion using EDITSEARCH. The previously recorded portion will be erased.



1 **Turn STANDBY up to put the camcorder into standby mode.**

2 **Look inside the viewfinder and find the point from which you want to begin the recording.**

Do this by continuously pressing either the + (plus, forward playback) or the – (minus, reverse playback) side of the EDITSEARCH button.

3 **At the desired point, release EDITSEARCH.**

4 **Press START/STOP to start recording.**

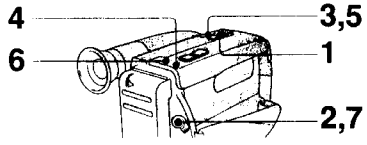
Recording begins from the point you release EDITSEARCH. A smooth transition between scenes can be made after the prerecorded portion even if STANDBY is turned down and up, or even the power is turned off and on again, as long as your tape is not removed.

To pause Press START/STOP again.

To stop Turn STANDBY down.

Inserting a Scene in the Middle of a Recorded Tape (Insert Recording)

You can insert a scene in the middle of a recorded tape. Set the starting and ending point of the insert using EDITSEARCH. The previously recorded portion will be replaced by the inserted scene.



1 **While pressing the small green button on POWER, slide POWER to CAMERA.**

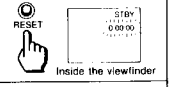
2 **Turn STANDBY up.**

3 **While looking inside the viewfinder, keep pressing the + (plus, forward playback) or – (minus, reverse playback) side of EDITSEARCH, and release the button where you want to end the insertion.**

The camcorder enters standby mode again.

4 **Press RESET.**

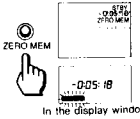
The counter resets to zero.
This works as an end point mark.



5 **While looking inside the viewfinder, keep pressing the – (minus) side of EDITSEARCH and release the button at the point where you want to start the insertion.**

6 **Press ZERO MEMO.**

The insert end point is stored in memory.



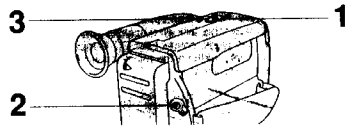
7 **Press START/STOP.**
Insert recording begins. The insert recording stops automatically at the counter zero point.

To cancel ZERO MEM Press ZERO MEM.

Note The picture may be slightly distorted at the ending point when played back.

Checking Recording inside the Viewfinder (EDITSEARCH)

You can check the recorded picture inside the viewfinder using EDITSEARCH.



1 **While pressing the small green button on POWER, slide POWER to CAMERA.**

2 **Turn STANDBY up.**

3 **Keep pressing the + (plus) or – (minus) side of EDITSEARCH to play back the picture.**

+ (plus) side: to view the playback picture
– (minus) side: to view the playback picture in reverse

To stop playback Release EDITSEARCH.

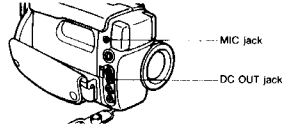
To Monitor the Sound

By using headphones (not supplied) you can monitor the sound while viewing the playback picture inside the viewfinder.

1 Connect headphones (not supplied) to the PHONES jack.
2 While pressing the small green button on POWER, slide POWER to VTR.
3 Press ◀◀ to rewind the tape and press □ where you want to stop.
4 Press ▷ to start playback.

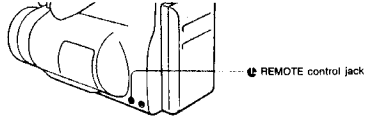
Recording with an External Microphone

You can connect an optional external microphone (stereo or monaural) to the MIC jack. This jack also accepts a "plug-in-power" microphone. If the microphone has two plugs, connect the DC IN plug to the DC OUT jack of the camcorder. If you want to attach the microphone to the camcorder, you also need an optional shoe attachment.



Connecting a Wired Remote Control Unit

When you connect an optional wired remote control unit or editing controller to the ⇵ REMOTE control jack on the camcorder, you can operate your camcorder from a distance. In this case, be sure to set the REMOTE COMMANDER ON/OFF switch of the camcorder to OFF.



About ⇵ (LANC) ⇵ stands for Local Application Control Bus System. The ⇵ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the connectors indicated as CONTROL L or REMOTE.

Preventing Accidental Erasure

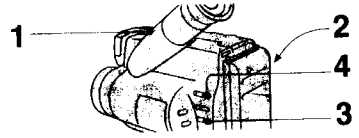
Slide the tab on the cassette to expose the red mark. This will prevent accidental recording.
If you try to record with the red mark exposed, the ⏏ and ⏏ indications flash inside the viewfinder and in the display window, and you cannot record. To re-record on this tape, slide the tab back out covering the red mark.

Notes on handling cassettes

- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type and thickness of the tape, or whether the red mark is exposed or covered, etc. Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- Store cassettes in their cases and keep them away from heat, humidity, direct sunlight, magnetic fields, dust and mold.

Using the World Clock

You can reset the clock according to the time where you are using the camcorder by pressing the AREA button.
Before using the world clock, set the date and time settings (see page 9).

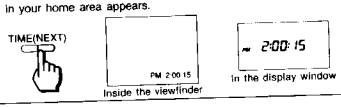


1 **While pressing the small green button on POWER, slide POWER to CAMERA.**

2 **Turn STANDBY up.**

3 **Press TIME.**

The time in your home area appears.



4 **Press AREA until the area name and number of where you are now using the camcorder appear.**

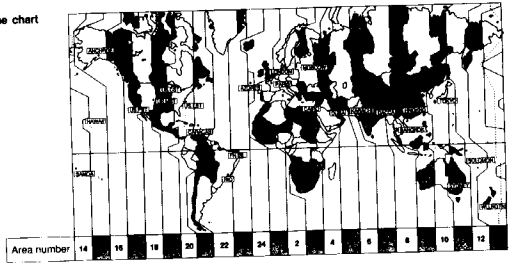
See the "Time zone chart" on the next page.
The time where you now are appears.

To check the date Press DATE (+).
To turn off the date indication, press DATE (+) again.

To adjust to daylight savings time Press DST.
The time changes to daylight savings time.
To reset to the standard time, press DST again.

To re-set to your home area time again Press AREA until your home area name appears.

Time zone chart



Area number	Area name	Nations or area*
1	LONDON	England, GMT (Greenwich Mean Time), Portugal
2	PARIS	Austria, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland
3	CAIRO	Egypt, Greece, Turkey
4	MOSCOW	Iraq, Kenya, Saudi Arabia, U.S.S.R. (west)
5	DUBAI	United Arab Emirates
6	KARACHI	Moldives, Pakistan
7	DACCA	Bangladesh, India, Myanmar
8	BANGKOK	Cambodia, Indonesia (Bali, Jakarta), Thailand, Vietnam
9	HNGKNG	Australia (west), China, Hong Kong, Indonesia (Borneo), Malaysia, the Philippines, Singapore, Taiwan
10	TOKYO	Japan, Korea
11	SYDNEY	Australia (east), Guam, Saipan
12	SOLOMON	New Caledonia
13	WLLNGTN	Fiji, New Zealand
14	SAMOA	Western Samoa
15	HAWAII	HST (Hawaii standard time), Tahiti
16	ANCHRGE	AST (Alaska standard time)
17	US. PST	PST (Pacific standard time)
18	US. MST	MST (Mountain standard time)
19	US. CST	CST (Central standard time), Mexico
20	US. EST	EST (East standard time), Peru
21	CARACAS	Chile, Venezuela
22	RIO	Argentina, Brazil
23	FN ISL.	Fernando de Noronha
24	AZORES	Azores Islands

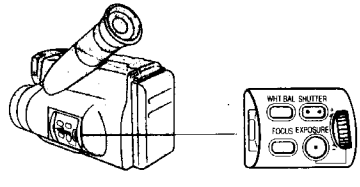
* These are common names. They may be different from formal country names.

Selecting Automatic/Manual Adjustment Mode

This section shows you how to record manually. The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for creative recording. You can manually adjust the following items with this camcorder:

- Focus
- White balance
- Exposure
- Shutter speed

For manual adjustment, open the AUTO LOCK cover and select an appropriate setting.
When you close the AUTO LOCK cover, the focus, white balance, and exposure return to automatic adjustment. The shutter speed is set to 1/60.



Functions of the AUTO LOCK cover

When the AUTO LOCK cover is closed, white balance, exposure and/or shutter speed returns to the normal settings regardless of the setting you made. Focus is kept at autofocusing. Closing the AUTO LOCK cover disables these control buttons. Opening the AUTO LOCK cover enables the control buttons to be set manually. And you can change whatever settings you like, according to the shooting situation.

The settings you made are retained as long as:

- the battery is in place.
- you have inserted a lithium battery in your camcorder and within 5 minutes of having removed the battery.

Focusing Manually

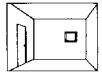
This section shows you how to focus manually.

When to use manual focus

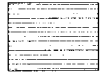
In the following cases you should obtain better results by adjusting the focus manually.

Too much brightness behind the subject

Subjects with little contrast-wall, sky, etc.



Horizontal stripes



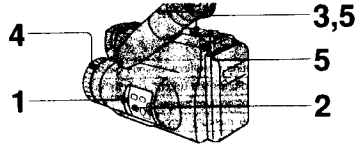
Subject through frosted glass

- Insufficient light
- One subject is close; the other is in the center, but at a distance
- Subjects beyond nets, etc., or another subject passes in front of the camcorder
- Bright subject or subject reflecting light
- High contrast behind the subject (the background may be focused)
- When using conversion lenses or effect filters
- When shooting a stationary subject using tripod
- When you want to save battery power
- Autofocusing does not function momentarily when:
  - The setting of the shutter speed is changed.
  - Exposure is adjusted manually.
  - Lighting conditions change quickly.
  - Zooming is done from wide range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is not perfect in the above situations.

Focusing Manually

When adjusting focus manually, the best way is to first adjust at telephoto position before recording, then set the desired zoom angle.
Let's go through it step by step.



1 **Slide open the AUTO LOCK cover.**

2 **Press FOCUS.**
The ⓕ indication appears inside the viewfinder. This indicates that you are in manual focus mode.

3 **Keep pressing the T side (telephoto) of the power zoom button until the zooming stops.**

4 **Turn the focus ring to achieve sharp focus.**

Note
The focus ring does not have a stop position.

5 **Set the desired shot length using the power zoom button.**

To reactive autofocusing

Press FOCUS until the ⓕ indication inside the viewfinder disappears.

Shooting in relatively dark places

When shooting in relatively dark places such as indoors, the depth of field (distance range of the subject that will be in sharp focus) is very shallow. For best results, shoot at wide angle after focusing in the telephoto position.

Adjusting the White Balance

This section shows you what white balance is and how to adjust it.

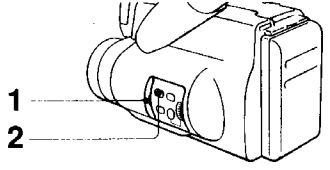
What is white balance

White balance adjustment is the adjustment of the camcorder to the most natural color temperature under the given lighting conditions.
In the following cases, you should obtain better results by adjusting the white balance manually.

Conditions	White balance mode (indication inside the viewfinder)
Lighting conditions change quickly	☆
Conditions too bright, such as in photography studios	
Under sodium lamps	
Under mercury lamps	
Monochromatic subject or background	HOLD
Under a color matching fluorescent lamp	✳
Recording: • a sunset/sunrise • just after sunset • just before sunrise e.g. neon signs, fireworks	

Adjusting the White Balance

There are 3 modes for manual white balance adjustment.
Indoor and outdoor modes are pre-set color temperature.
Hold mode locks in certain color temperature after automatic adjustment.

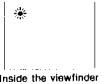


1 **Slide open the AUTO LOCK cover.**

2 **Select the desired white balance mode (see page 38) by pressing WHT BAL.**

Each time you press the button, the indication inside the viewfinder changes as follows:

No indication (auto) → HOLD → ✳ (outdoor) → ☆ (indoor)



Note on manual adjustment

When moving from indoors to outdoors, or vice versa, press WHT BAL until the white balance indication inside the viewfinder disappears and adjust the white balance in auto mode, then reset the white balance manually.

Locking the White Balance Setting (HOLD Mode)

HOLD mode allows you to lock in to certain color temperatures.

What is HOLD mode?

In HOLD mode, the camcorder automatically adjusts the white balance according to the color temperature of the subject's light source and keeps that setting during recording. When recording some subjects with different color temperatures (when lighting conditions change frequently), use HOLD mode. Then, you can achieve a recording with natural colors without being affected by the surroundings.

To enter HOLD mode

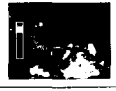
1 Close the AUTO LOCK cover.
The white balance enters automatic mode.
2 Point the camcorder at a white, flat object such as a white wall or paper and record it for about 15 seconds.
3 Open the AUTO LOCK cover.
4 Press WHT BAL to display the HOLD indication inside the viewfinder.
When you change the battery pack, the white balance setting, or the light source, you need to enter HOLD mode again. In this case, follow the procedures above again.

Adjusting the Exposure

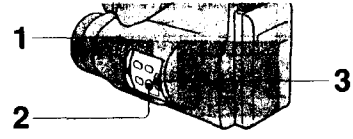
This section shows you when and how you adjust the exposure.

When you adjust the exposure

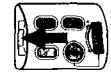
In the following cases you should obtain better results by adjusting the exposure manually.

Condition:	Turn the dial:	Result
The backgroud is too bright (backlighting)	upward	
Insufficient light: most of the picture is dark 		
Bright subject and dark backgroud	downward	
To record the darkness faithfully		

Adjusting the Exposure

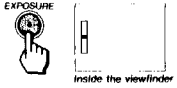


1 Slide open the AUTO LOCK cover.



2 Press EXPOSURE.

The exposure indication appears.



3 Adjust the exposure by rotating the dial.

To re-enter the automatic exposure mode

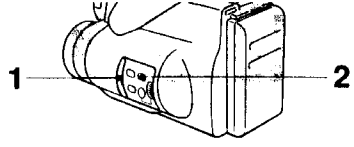
Press EXPOSURE until the exposure indication inside the viewfinder disappears.

Using the High-speed Shutter

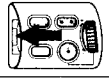
When you record a fast-moving subject, choose a higher shutter speed. The movement will look sharper during freeze frame when played back the tape with an 8mm recorder that has the clearn still function. Remember that you need enough lighting to use the high-speed shutter.

Selecting the Shutter Speed

You can select the shutter speed from 1/60 to 1/10,000.

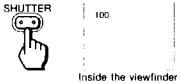


1 **Slide open the AUTO LOCK cover.**



2 **Press SHUTTER repeatedly until the desired shutter speed indication appears inside the viewfinder. Each time you press the button, the indication changes as follows:**

No indication (1/60) → 100 (1/100) → 250 (1/250) → 1000 (1/1000)
↑
10000 (1/10000) ← 4000 (1/4000) ← 2000 (1/2000) ←



To choose the best shutter speed

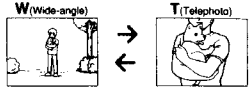
Example use	For your selection
• On clear days, recording golf or tennis swing (To view the hit ball clearly in the still picture mode, set to 1/10000 or 1/4000) • Recording skiers	1/10000 or 1/4000 or 1/2000
• On overcast days, recording a moving carousel or roller coaster • Recording outdoors from inside a moving vehicle (for stable shooting)	1/1000 or 1/250
• Instead of using the ND2 (neutral density) filter (To reduce the exposure level to about half) • Recording indoor sports (for stable shooting)	1/100

Notes on shutter speed

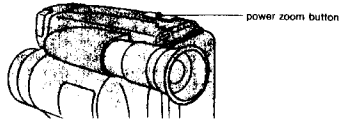
- When you select shutter speed 1/250 or faster, record under sunlight or use a video light.
- When you record a TV screen with certain shutter speeds, the brightness of the recorded picture may vary.
- When you shoot a very bright subject at a faster shutter speed, a light vertical, belt-like line ("smear") may appear on the screen when played back.
- When you record at certain shutter speeds under a discharged tube light, such as a fluorescent lamp, sodium lamp or mercury lamp, the brightness of the recorded picture may vary.

Zooming

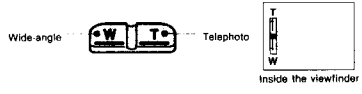
You can change the size of the subject in the scene. Use the zoom to focus manually or to decide the shooting angle. Also use "zoom-in (Telephoto)" for dramatic close-ups. Use "zoom-out (Wide-angle)" for panoramic long shots. The most common mistake, however, is using zoom-in or zoom-out too often while recording. For natural recording, you may want to set the zoom first and then start recording.



To zoom



Press the T side of power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).



Focal length

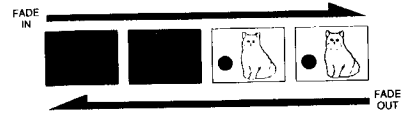
The focal length of this camcorder is 8.5 mm to 68 mm (1/3 to 2 3/4 inches). This means approximately 46 mm to 368 mm (1 13/16 to 14 1/2 inches) when converted into the focal length of a 35-mm still camera.

Options

When you use VCL-0637A, VCL-1437A or VCL-TRA (a 37 mm conversion lens/not supplied), you can get more telephoto angle or wider angle.
If you use a 46 mm conversion lens, attach it using the supplied step-up ring. In this case, frame of the lens may appear in both side of the picture.
For details, consult your Sony dealer.

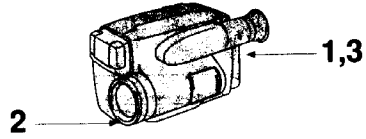
Fade-In and Fade-out

This section shows you how to fade-in and fade-out to add a professional touch to your tape.



Fading in

You can make the picture gradually appear from black and the sound increase by using the fade-in function.



1 **Turn STANDBY up to put the camcorder into standby mode.**

2 **Press FADER.**

The "FADER" indication appears inside the viewfinder.

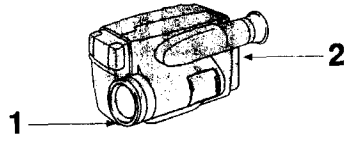
3 **Press START/STOP.**

The recording starts fading in.

Fade-in and Fade-out

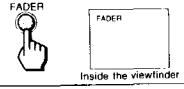
Fading out

You can make the picture gradually fade to black and the sound decrease by using the fade-out function.



1 **While recording, press FADER.**

The "FADER" indication appears in the viewfinder.



2 **Press START/STOP to stop the recording.**

The recording starts fading out and stops.

To cancel the fade-in/fade-out function Before pressing START/STOP, press FADER again.

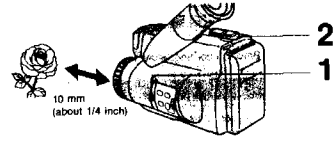
To use fade-in/fade-out repeatedly Start from step 1 each time.

Close-up (Macro)

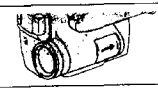
This section shows you how to shoot small subjects such as flowers, insects and photographs.

Close-up

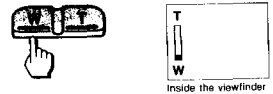
You can shoot subjects that are at least 10 mm (about 1/4 inch) away from the lens surface.



1 **Close the AUTO LOCK cover.**



2 **Press the W side of the power zoom button until the indicator inside the viewfinder stops at the W end.**

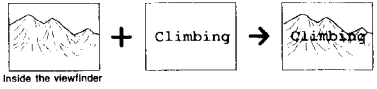


Manual adjustment You can shoot with manual focus in doing close up. For details, see page 37.

Note When doing close up, the depth of field (distance range of the subject that will be in sharp focus) is very shallow. So pay attention to focusing. To keep the subject in focus, use a tripod.

Superimposing Text

This section shows you how to superimpose your own hand written message (title) or graphics over the scene.

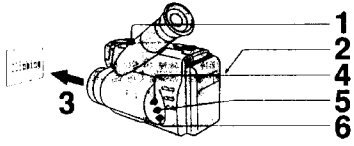


Inside the viewfinder

Before recording, store the title or graphics.

Storing a Title

You can store one title at a time.
Before you store the title, make card. Use a plain, white card and write a title with a dark-colored marker in thick letters. You can also use the available graphics or a sign if they are thick enough and have contrast.
Before you begin, make sure that the lithium battery is installed.



1 **While pressing the small green button on POWER, slide POWER to CAMERA.**

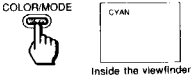
2 **Turn STANDBY up to put the camcorder into standby mode.**

3 **Point the camcorder at the title card and adjust the focus.**

4 **Press MEMORY to store the title.**

5 **Press COLOR/MODE and select the title color.**

Each time you press the button, the indication changes as follows:
WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK(black) ← YEL(yellow) ← VIO(violet) ← RED



Inside the viewfinder

6 **Press SUPERIMPOSE ON/OFF to turn off the title.**

Now, a title is stored in memory.

To check the title Press SUPERIMPOSE ON/OFF in standby mode.
To turn off the title, press the button again.

Memory back up The camcorder uses a lithium battery (located on the bottom of the camcorder) to keep the title in memory. The lithium battery will last for approximately 1 year in normal operation.

Putting a Title on Your Tape

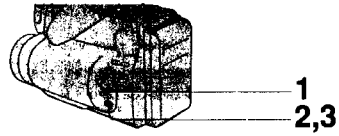
You can scroll up your title like scrolling credits in a movie. Also, you can reverse the title.

Various display modes of the title

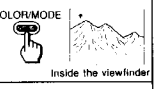
Display mode	Indication inside the viewfinder
Scrolling up the title The title scrolls up and stops at the center.	↑
Reversing the title with the picture	■
Scrolling up the reversed title	■↑
Normal display mode	No indication

Superimposing a Title

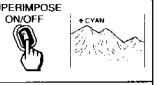
You can superimpose a title by following the procedure below.
The following example shows you how to superimpose a title in cyan with the scrolling up effect.
The color and the display mode indications inside the viewfinder will not be recorded.



1 **In standby mode, press COLOR/MODE to select the display mode of the title.**
(For display modes of the title, see page 49.)



2 **In standby mode, press SUPERIMPOSE ON/OFF at the point you want to insert the title.**



3 **At the point you want to turn off the title, press SUPERIMPOSE ON/OFF again.**
The title goes out.

Function of the COLOR/MODE button

This button has a double function: one is to select the title color and the other is to select the title display mode.
If the title is displayed, this button acts as the color selection button, but if the title is not displayed, it functions as the mode select button.

To superimpose a title at the beginning

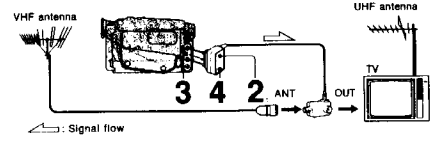
1 Set the camcorder in the standby mode.
2 Press SUPERIMPOSE ON/OFF.
The title appears.
3 Start recording with the title displayed inside the viewfinder.
4 At the point you want to turn off the title, press SUPERIMPOSE ON/OFF again.

Playing Back a Tape

This section shows you how to view the playback picture on the TV screen. You must connect the camcorder and the TV and/or VCR properly.
In an earlier section (page 16), we explained the basic connection to your TV. Here, we will show you several other methods of connection to your TV depending on the type of TV you have.
If you connect a TV which has video/audio inputs, see page 16.

If Your TV Has Only an Antenna Input

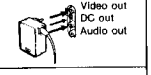
Use the supplied RFU adaptor to connect your camcorder to the TV. Make sure that the TV is turned off to prevent speaker damage before hooking up to your camcorder. The sound will be in monaural.



To add your camcorder connection to a TV which already has a regular TV (VHF) antenna attached, you need to do the following procedure.

1 **Unplug the antenna cable from the TV first.**
Plug the tail-end of the RFU adaptor marked OUT into the antenna input of your TV. Re-wire the antenna cable you unplugged to the RFU adaptor jack marked ANT. This way, you can switch between TV broadcasts and your home video playback without re-wiring.

2 **Connect the RFU adaptor to the camcorder.**



3 **Slide INPUT/OUTPUT on the camcorder to OUTPUT.**

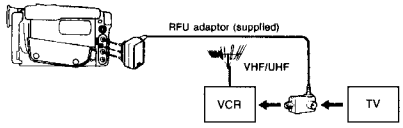
4 **Set the channel selector on the RFU adaptor (and your TV channel) to 3CH or 4CH of the VHF channel, whichever is not active (vacant) in your area.**

Connecting to a TV via a VCR

You can connect the camcorder to a TV via a VCR.

When your TV is without video/ audio inputs

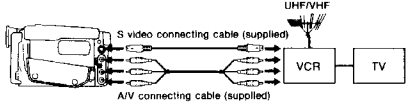
In this case, the sound will be in monaural.



1 **Disconnect the antenna connection between the TV and the VCR, and connect the RFU adaptor (supplied) to the VHF/UHF input on the TV and VHF/UHF output on the VCR.**

2 **Slide INPUT/OUTPUT on the camcorder to OUTPUT.**

When your TV has video/audio inputs



1 Connect the camcorder to the VCR using the supplied A/V connecting cable.
- If your TV has an S video input jack, connect the S video jack on the camcorder and the S video input jack on the TV using the S video connecting cable (supplied). In this case, you do not need to connect the yellow (video) plug of the A/V connecting cable.
- If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV. Do not use the red plug. In this case, the sound will be in monaural.

2 Slide INPUT/OUTPUT on the camcorder to OUTPUT.
3 Set the TV/VCR selector on the TV to VCR.

Various Playback Modes

With this camcorder, you can:
- view a still picture (playback pause)
- monitor a high-speed picture (picture search)
- monitor a fast-moving picture (skip scan)

Still picture (playback pause)

To view the still picture, press ❚❚ PAUSE during playback.
❚❚ appears in the display window.
To resume normal playback, press ▷ or ❚❚ .

Note
When the still picture mode lasts for 5 minutes or more, the camcorder automatically stops.

High-speed picture search

To monitor picture in high speed and locate a desired scene quickly, keep pressing ◀◀ or ▶▶ during playback.
To resume normal playback, release the button.

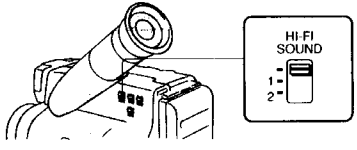
High speed search during fastfoward or rewind (skip scan)

You can also go into high speed search during fastfoward or rewind to locate a desired scene more quickly. Press ◀◀ while rewinding or ▶▶ while advancing the tape.
To resume normal playback, press ▷ .

Notes
- During the various playback modes, streaks appear on the screen.
- During the various playback modes, you cannot hear the sound.

Selecting the monitor sound

You can select the playback sound with the HI-FI SOUND switch.



- Normally, set the HI-FI SOUND switch to the "Green position".
- When you playback a tape with monaural sound, monaural sound will come out from the both audio jacks with the switch set to "Green position".
- Set the switch to "1" or "2" only when playing back a dual sound track tape such as a bilingual sound track tape.

In playback pause mode

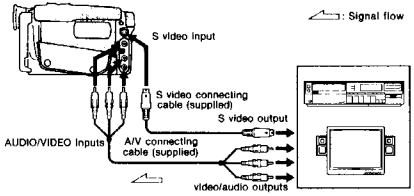
You can view the picture in a sequence of stop-motion images by pressing EDITSEARCH. If you keep pressing EDIT-SEARCH, you can view the picture playback in forward or reverse direction.

Recording

This section shows you how to record from a VCR or TV.

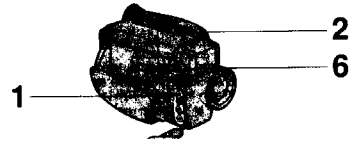
Recording from a VCR or TV

You can record a tape from another VCR, or a TV program from the TV if both are equipped with video/audio outputs.



- Disconnect the RFU adaptor from camcorder if it has been connected.
- Make connections using the supplied A/V connecting cable.
- If your TV has an S video output jack, connect the S video jack on the camcorder and the S video output jack on the TV using the S video connecting cable (supplied). In this case, you do not need to connect the yellow (video) plug of the A/V connecting cable.
- If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV or the VCR. Do not use the red plug. In this case, the sound will be in monaural.

To record



1 **Make sure that INPUT/OUTPUT is set to INPUT.**

2 **While pressing the small green button on POWER, slide POWER to VTR.**

3 **Insert a tape in the camcorder.**

4 **Turn on the VCR or TV.**

5 **Play back the tape (in another VCR) or select the TV channel to be recorded.**

6 **Slide ● REC in the direction of the arrow.**

Recording starts. You can monitor the picture being recorded inside the viewfinder.

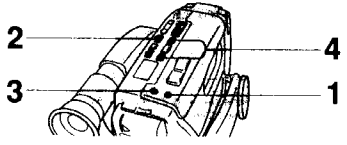
Using the Tape Counter

During recording or playback, you can see the tape counter indicating the actual recording or playback time.
Picture must be recorded on the tape in order for the tape counter to function.
Tape counter does not work on blank portion.

To count the whole tape

Press RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

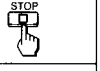
To return to a pre-registered point



1 During playback, press RESET at the point you later want to locate.

The counter shows "0:00:00".

2 Press □ when playback has finished, as usual.



3 Press ZERO MEM.

The " ZERO MEMO " indicator flashes.

Note

The ZERO MEM does not function during recording or playback.

4 Press ◀◀ or ▶▶.

The tape rewinds or advances and stops automatically when the counter reaches approximately zero.
The ZERO MEM mode is canceled automatically once the tape is rewound or sent forward to the point you pre-registered.

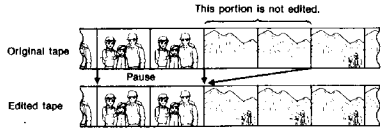
Note

The counter reading and the point on the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you fast-forward or rewind repeatedly and also if you play back a tape recorded in LP (Long play) and SP (Standard Play) modes mixed.

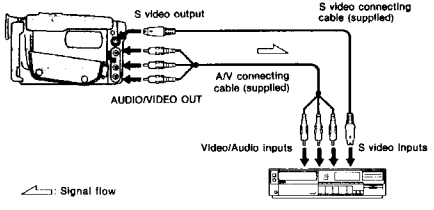
This section shows you how to edit your tape.

Editing Tapes with a VCR

You can create your own video program by editing with any other 8 mm, Hi8 mm, Betamax, ED Beta ED Betamax, VHS, S-VHS, VHSC, S-VHSC S-VHSC VCRs that has video/audio inputs.

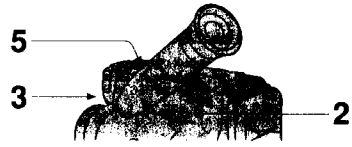


Connection



1 Connect the camcorder and the VCR using the supplied A/V connecting cable.
2 Set the input selector on the VCR to LINE, if available.
- If your TV has an S video input jack, connect the S video jack on the camcorder and the S video input jack on the TV using the S video connecting cable (supplied). In this case, you do not need to connect the yellow (video) plug of the A/V connecting cable.
- If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV. Do not use the red plug. In this case, the sound will be in monaural.

How to edit



1 Insert a tape to be recorded into the recording VCR.

2 Slide EDIT on the camcorder in the direction of the arrow.

3 Make sure that INPUT/OUTPUT is set to OUTPUT.

4 While pressing the small green button on POWER, slide POWER to VTR.

5 Insert your recorded tape into the camcorder.

6 Play back tape on the camcorder until you locate the point where you want to start editing, then set the camcorder to the playback pause mode.

7 On the recording VCR, locate the recording start point and set the VCR to the recording pause mode.

8 Press ❚❚ PAUSE on the camcorder and VCR simultaneously to start editing.

To edit more scenes Repeat steps 6 to 8.

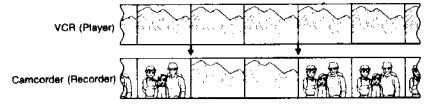
To stop editing momentarily Press ❚❚ on the recording VCR.

To stop editing Press □ on both the camcorder and the VCR.

Use of the EDIT switch When you slide EDIT in the direction of the arrow (EDIT ON), you can keep picture and deteriorations resulting from editing to a minimum. Avoid using the edited tape for multiple generations of editing. However, when you edit or copy to another VCR after editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

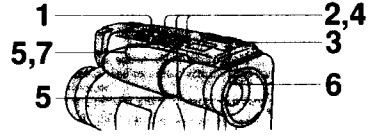
Replacing Recording on a Tape (Insert Editing)

You can insert a new scene from a VCR onto your originally recorded tape by specifying starting and ending points.



Connection Connections are the same as in "Recording from a VCR or TV (page 54)". Before you begin replacing recordings, **set the VCR to the playback pause mode at the beginning of the scene to be recorded.**

To replace recordings



1 While pressing the small green button on POWER, slide POWER to VTR.

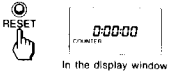
The counter appears in the display window.

2 **Locate the end point where the insert should end by pressing ◀◀ or ▶▶ during playback.**

The viewfinder screen shows a high-speed playback picture.

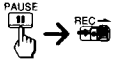
3 **At the end point, press RESET.**

The counter resets to "0:00:0".



4 **Locate the start point where the insert should begin by pressing ◀◀.**

5 **At the start point, put the camcorder into recording standby mode.**



6 **Press ZERO MEM.**

The end point of the insert is stored in memory.

7 **Press ❚❚ on both the camcorder and the VCR to start insert editing.**

You can monitor the picture being inserted inside the viewfinder screen.
The insert recording stops automatically near the zero point on the counter.

To change the end point Press ZERO MEM so that the ZERO MEM indication disappears, and begin from step 2.

Note You can play back a tape in normal/reverse direction by keep pressing EDITSEARCH during recording standby or playback pause. You can also play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

Usable Cassettes and Recording/Playback Modes

This section shows you the usable cassettes and recording/playback modes with your camcorder.

Hi 8/standard 8 mm system

The Hi8 system is an extension of the standard 8 mm system, and was developed for a higher quality picture. You can use both of the Hi8 video cassette and standard 8 mm cassette with your camcorder.

When You Record

When the Hi8 AUTO/OFF switch is set to AUTO, the recording mode is automatically selected according to the system of the tape.
--- Hi8 tape recorded in the Hi8 system.
--- Standard 8 mm tape recorded in the standard 8 mm system.

You can use a Hi8 tape in the standard 8 mm recording mode.
If you are going to play back the tape using a standard 8 mm video recorder, you should record the tape in the standard 8 mm system. In this case, set the Hi8 AUTO/OFF switch to OFF while recording.

Cassette used	System in that the tape recorded	Position of the Hi8 AUTO/OFF switch
Hi8 **Hi 8**	Hi8	AUTO
	Standard 8 mm	OFF
Standard 8 mm 8	Standard 8 mm*	OFF

*A standard 8 mm tape cannot be recorded in the Hi8 system.

When You Play Back

The playback mode is selected automatically according to the recording system (Hi8/standard 8mm, SP/LP) with which the tape has been recorded.

AFM Hi-Fi stereo In the following cases, the sound will be in monaural.
- When you play back a tape recorded with this camcorder on an AFM Hi-Fi monaural video recorder.
- If you play back a tape with this camcorder that has been recorded on AFM Hi-Fi monaural video recorder.

Dual sound You can playback a dual sound recorded tape.
Set the Hi-Fi SOUND switch to "1" or "2". For details, see page 53.

Foreign 8 mm video You may not be able to play back foreign pre-recorded software because of the difference in the TV color systems.

PCM sound PCM recording or playback is not possible with this camcorder. The PCM sound recorded or after-recorded with another video recorder cannot be played back with this camcorder.

Maintenance Information

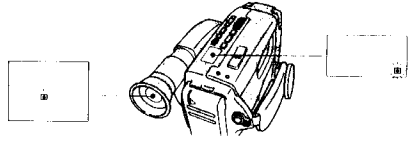
This section shows you how to maintain the camcorder.

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the camcorder may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

Inside the camcorder

If moisture condenses inside the camcorder, the [] indication inside the viewfinder and in the display window flashes. When the cassette is inserted, the ⏏ indication also flashes.



In such case, no other function but the tape ejection works.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least 1 hour in a dry place.
The camcorder can be used again if the [] indication does not appear when the power is turned on again.

On the surface of the tape

When the cassette is inserted and a tape transport button (▷, ▶▶, etc.) is pressed, the ⏏ indication in the display window flashes.

In the display window

In such case, no other function but the tape ejection works.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least 1 hour in a dry place.
The camcorder can be used again if the ⏏ indication does not appear when you insert the cassette and press one of the tape transport buttons.

On the lens

If moisture condenses on the lens, no indication appears, but the picture becomes dim. Turn off power and leave the camcorder unused for about 1 hour.

Video Head Cleaning

To ensure clear pictures, clean the video heads periodically.
When playback pictures are noisy or hardly visible, the video heads may be contaminated.

Slight contamination ⟶ Critical contamination

In such cases, follow the procedures below:
1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2 After cleaning, check to see if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

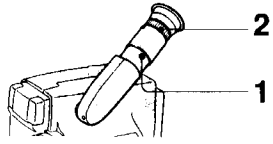
Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

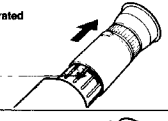
Cleaning

Viewfinder

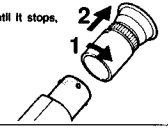
You can remove dust from inside the viewfinder.



1 **Pull out viewfinder barrel until the illustrated mark appears.**

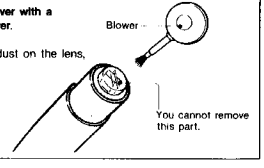


2 **Turn the viewfinder counterclockwise until it stops, and pull it out.**



3 **Clean the surface of the cover with a commercially available blower.**

If you want to remove the dust on the lens, use an applicator.



Lens

Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.

Body

Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Tips for Better Camera Recording

This section shows you some hints for better shooting.

Achieving Better Camera Recording

You can get better pictures following the hints below.

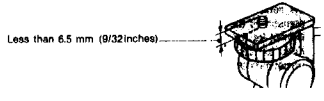
How to hold the camcorder

For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip belt so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it.
  When adjusting the focus manually, make sure the camcorder does not move.
- Stand opposite the subject and let your feet take a comfortable stance.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod

If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a table top or any other flat surface of suitable height.



Caution

When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm (9/32 inches). Otherwise, the screw may damage the inner part of the camcorder.

Keep the horizontal plane level

You can easily determine the horizontal plane by using the viewfinder frame as a reference.

Plan ahead

If you are going to edit the tape after recording, shoot the scene a little longer to make the editing easier.

If you are not going to edit the tape after recording, first record a title and then use the START/STOP button to make a smooth recording.

Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background.
  In this case, the face will be recorded too dark.
  If it occurs, use the manual EXPOSURE function. (See page 40.)

Use the video light in the dark

To get the best colors, you must maintain a sufficient light level. Photography lamps or halogen lamps are recommended.
For best results, use of Sony video lights are recommended since their weight and low heat output levels allow safe and direct connection to the camcorder.
Excessive heat from another type of light may warp the casing of the camcorder.
If you want to attach the video light to the camcorder, you need a video light attachment (not supplied).
For detailed instructions on proper use of the light, read the instruction manual of the video light.

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camcorder.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder.**
  When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the camcorder to malfunction and sometimes the malfunction cannot be repaired.
- **Do not let the camcorder get wet.**
  Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.

On care

When the camcorder is not to be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera and player sections and play back a tape for about 3 minutes.

On copyright

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Using Your Camcorder Abroad

Each country has its own electricity and TV color systems.
Before using your camcorder abroad, check the following points.

Power sources

You can use your camcorder in any country with the supplied AC power adaptor within 100 V to 240 V AC, 50/60 Hz. If you cannot attach the power adaptor to the wall outlet, use a power cord plug adaptor (not supplied).

To view the playback picture

You can view the playback picture inside the viewfinder. However, if you want to view the playback picture on a TV, it must be a TV based on the NTSC system, as this camcorder is an NTSC system based camcorder. You cannot view the playback picture on a TV based on another TV color system. Check the following list (in alphabetical order) for the TV color system.

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

Pal system countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany (former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country
Brazil

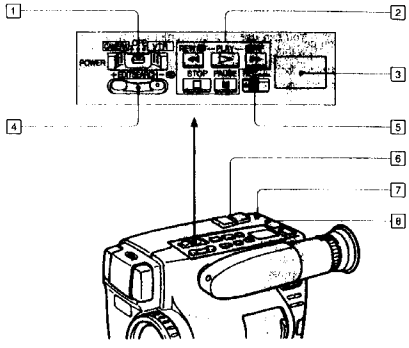
PAL N system countries
Argentina, Paraguay, Uruguay

SECAM system countries
Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, Soviet Union, etc.

World clock

You can use the world clock function abroad.
For details, see page 32.

For details on the use of each part, refer to the pages indicated in the circle.



[1] POWER switch ●

[2] Tape transport buttons ●, ●

▷ (playback)

▶▶ FF (fast forward)

◀◀ REW (rewind)

□ (stop)

❚❚ (pause)

[3] Display window ●, ●

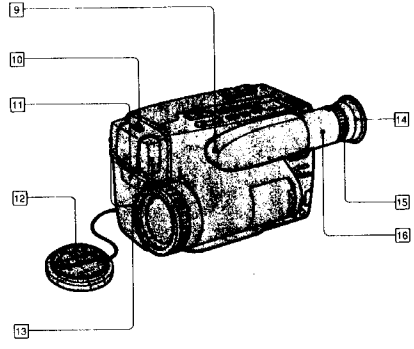
[4] EDITSEARCH button ●

[5] ● REC (recording) switch ●

[6] Power zoom button ●

[7] RESET button ●, ●

[8] ZERO MEM (zero memory) button ●, ●



[9] Camera recording/battery lamp

[10] BUILT-IN MIC switch ●

[11] Remote control sensor ●

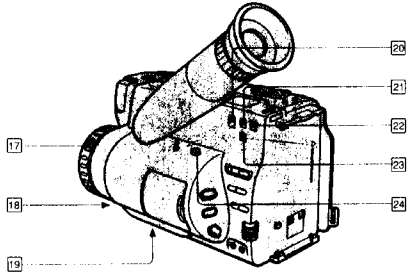
[12] Lens cap ●

[13] Built-in microphone (stereo)

[14] Eyecup ●

[15] Viewfinder lens adjustment ring ●

[16] Viewfinder ●



17 Focus ring ●

18 FADER button ●

19 Lithium battery compartment ●

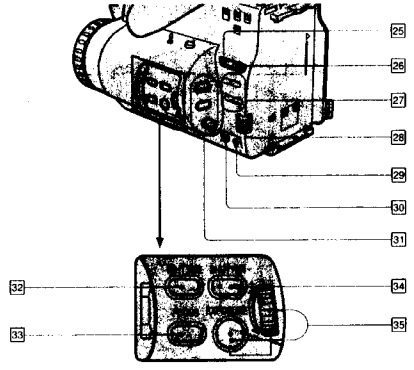
20 HI-FI SOUND switch ●

21 Remote Commander ON/OFF switch ● ●

22 AUTO/OFF switch ●

23 EDIT switch ●

24 REC start/stop button ●



25 DST button ●

26 AREA button ●

27 DATE and TIME buttons ●

28 BATT (battery eject) knob

29 PHONES (headphones) jack (stereo mini-jack) ●

30 REMOTE control jack (mini-mini-jack) ●

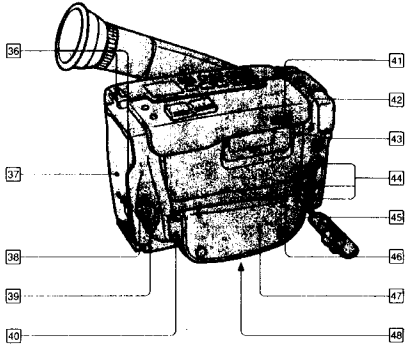
31 SUPERIMPOSE buttons ●
MEMORY button
COLOR/MODE button
SUPERIMPOSE ON/OFF button

32 WHT BAL (white balance) button ●

33 FOCUS button ●

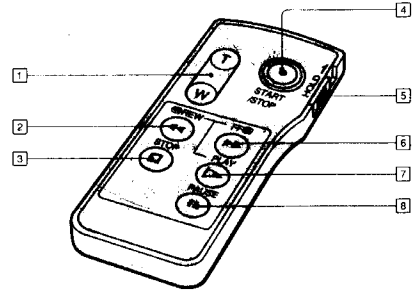
34 SHUTTER button ●

35 EXPOSURE button and dial ●



36 Hooks for shoulder strap
37 Battery mounting surface
38 START/STOP button ●
39 STANDBY switch ●
40 Grip strap
41 Lid lock
42 MIC jack (PLUG IN POWER) (stereo mini-jack) ●
43 S video jack ●
44 VIDEO/AUDIO jacks (phono jacks) ●
45 DC OUT (DC output) jack ●
46 VIDEO/AUDIO INPUT/OUTPUT selector switch ●
47 Grip strap cover
48 Tripod receptacle ●

Wireless Remote Commander



1 Power zoom button
2 ◀◀ REW (rewind) button
3 □ STOP button
4 START/STOP button
5 HOLD switch ●
6 ▶▶ FF (fast forward) button
7 ▷ PLAY (playback) button
8 ❚❚ PAUSE button

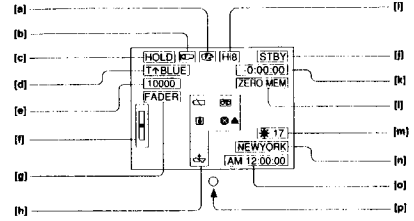
Indications Inside the Viewfinder and in the Display Window

Warning Indications

If indications flash inside the viewfinder or in the display window or a caution lamp on the camcorder flashes, check the following table:

	viewfinder	display window
Battery Remaining Slow flashing: The battery ia weak. Fast flashing: The battery is dead.		
The tape is near the end.		
The tape has run out.		
No tape has been inserted.		
The tab on the tape is out (red).		
Moisture condensation has occurred.		
The video heads may be contaminated.		
Some other trouble has occured. Disconnect the power source and contact your Sony dealer or local authorized facility.		
The lithium battery is weak or no lithium battery is installed.		

Inside the Viewfinder



[a] Manual focusing ( )

[b] WIND has been selected. ( )

[c] White balance mode (, , HOLD)

[d] Title mode and color

[e] Shutter speed

[f] Power zoom indication/Exposure indication

[g] FADER has been pressed

[h] Warning indications

[i] Lights up while recording in Hi8 system

[j] Tape transport mode

[k] Tape counter

[l] ZERO MEM is pressed.

[m] Area number

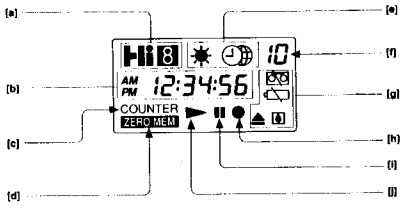
[n] Area name

[o] Date or Time

[p] Lights up during recording
When flashing: "Change battery or cassette."

Demonstration Indication
If you slide POWER to CAMERA while pressing □ (stop) and ❚❚ (PAUSE) simultaneously, the camcorder demonstrates examples of the world clock and the title display mode inside the viewfinder and on the connected TV screen. To turn off the demonstration indication, slide POWER to OFF or VTR.

In the Display Window



[a] Playing back or recording in Hi8 format

[b] Tape counter or time

[c] Tape counter indication

[d] ZERO MEM is pressed

[e] World clock indication

[f] Area number

[g] Warning indications (See page 74.)

[h] Recording

[i] Pausing

[j] Playing back

Trouble Check

If any difficulty should arise during operation, go through the following table. Should the difficulty persist, disconnect the power source and contact your Sony dealer or local authorized Sony service facility.

Symptom	Cause	Corrective Actions (Refer to the pages indicated in the circle.)	Page
The power does not turn on.	The battery is not attached.	Attach the battery.	●
	The battery is dead.	Use a charged battry.	●
	The AC power adaptor is not connected a wall outlet.	Connect the adaptor to a wall outlet.	●
The power goes off.	While being operated in the CAMERA mode, the camcorder has been in the pause mode for more than 5 minutes.	Turn STANDBY to LOCK at once and turn it to STANDBY again.	●
	The battery is dead.	Use a charged battery.	●
The battery pack is quickly discharged.	The ambient temperature is too low.	—	●
	The battery pack has not been charged fully.	Charge the battery pack again.	●
	The battery pack is completely dead, and cannot be recharged.	Use another battery pack.	●
START/STOP does not operate.	The tape is stuck to the drum.	Remove the cassette with the cassete eject button.	●
	The tape has run out.	Rewind the tape or use a new one.	—
	POWER is set to VTR.	Set it to CAMERA.	●
	The tab on the cassette is out (red).	Use a new tape or slide the tab.	●
The cassette cannot be removed from the compartment.	The battery is dead.	Use a charged battery or the AC power adaptor.	●●
No function except for cassette ejection works.	Moisture condensation has occurred.	Remove the cassette and leave the camcorder at least an hour.	●
The tape does not move when a tape transport button is pressed.	POWER is set to CAMERA or OFF.	Set it to VTR.	●
	The tape has run out.	Rewind the tape or use a new one.	—
The autofocusing function does not work.	The AUTO LOCK cover is not closed tightly.	Close the AUTO LOCK cover.	●●
	Shooting conditions are not suitable for autofocusing operation.	Open the AUTO LOCK cover and press FOCUS to adjust the focus manually.	●
The image on the viewfinder screen is not clear.	The viewfinder lens is not adjusted.	Adjust the viewfinder lens.	●

(Continued)

A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	The contrast between the subject and background is too high: The camcorder is not malfunctioning.	Change locations.	–
The color of the playback picture is not appropriate.	The AUTO LOCK cover was not closed tightly.	–	–
	Shooting conditions were not suitable for auto white balance operation.	–	●
The playback picture is not clear.	EDIT is set in the direction of the arrow.	Set EDIT in the opposite direction of the arrow.	●
	The channel or input for the camcorder is not selected on the TV.	Select correctly.	●
The picture is noisy.	The video heads may be contaminated.	Clean the heads using the Sony V8-25CLH cleaning cassette.	●
No sound or only a low sound is heard when playing back a tape.	The stereo tape is played back with the HI-FI SOUND switch set to " 1 " or " 2 ".	Set the switch to "Green position".	●
Excessive high-pitched sound is heard.	The picture has been recorded with BUILT-IN MIC set to " WIND ".	When there is no wind, set the switch to the green position.	●
Recording on another tape is impossible.	The INPUT/OUTPUT selector is set to INPUT.	Set to OUTPUT.	●●
Recording a TV program or recording from another tape is impossible.	The INIPUT/OUTPUT selector is set to OUTPUT.	Set to INPUT.	●
When you adjust the clock by viewing picture on the connected TV, the area name and area number do not appear on the screen.	The area name and area number do not output from video OUTPUT.	–	–
The demonstration indicator flashes inside the viewfinder.	The camcorder is in the demonstration mode.	Slide POWER to OFF or VTR.	●
The supplied Remote Commander does not function.	The REMOTE COMMANDER ON/OFF switch is set to OFF.	Set the switch to ON.	●
	Something interrupts the infrared rays.	Take off the obstacles.	–
	The lithium battery is not inserted with the correct polarity.	Insert the lithium battery with the correct polarity.	●
	The lithium battery is dead.	Insert a new one.	●
	The HOLD switch is working.	Set the switch in the direction opposite the arrow.	●
The wired remote commander (optional) does not function.	The REMOTE COMMANDER ON/OFF switch is set ot ON.	Set the switch to OFF.	●
There is dust inside the viewfinder.	–	Pull out the viewfinder and clean the viewfinder screen cover or viewfinder lens.	●